THE OPEN UNIVERSITY OF SRI LANKA
Department of Civil Engineering
Construction Management Programme – Level 7
Post Graduate Diploma
CEX7110 – Construction Project Appraisal
FINAL EXAMINATION – 2012/2013

Time Allowed: Three Hours

Date: 12-08-2013 (Monday) Time: 0930 - 1230 hrs.

The paper consists of 06 questions. Answer Four (04) questions.

Q1.

(a) Briefly explain what is understood by the following two terms; compounding and discounting. Use examples to illustrate your answer.

(Marks 06)

(b) Explain the term 'Economic Assessment' in relation to the construction industry.

(Marks 06)

(c) Explain 'Discounted cash flow yield' and state the benefits of this to a management of a company contemplating a new investment.

(Marks 06)

(d) Explain the effects of inflation on project appraisal computations conducted with the use of cash flow techniques.

(Marks 07)

Q2.

(a) Discuss the advantages and disadvantages of 'pay back period' as a capital investment appraisal method.

(Marks 10)

(b) A company is evaluating two machines; X and Y for the purpose of purchasing one. Machine X has a life of 4 years and an initial investment cost of Rs. 10,000,000. Machine Y has a life of 5 years and an initial investment cost of Rs. 10,000,000. The cost of capital is 14%. The tabe below depicts the yearly earnings for both the machines;

	Machine X (Rs. 000's)	Machine Y(Rs. 000's)
Year 1	4,400	3,100
Year 2	3,300	2,400
Year 3	3,200	2,200
Year 4	4,000	2,100
Year 5		1,500

Compute the payback period for each machine.

(Marks 08)

© Compute the Average Annual Rate of Return (AARR) for each machine given in (b) above. 00(
(Marks 07)

Q3

(a) A firm is considering three projects each with initial investment of Rs.1,000,000 and a life of 5 years. The profits generated by the projects are estimated to be as follows (all values in Rs.);

Year	Project 1	Project 2	Project 3
1	200,000	350,000	150,000
2	200,000	200,000	150,000
3	200,000	150,000	150,000
4	200,000	150,000	200,000
5	200,000	150,000	350,000
Total	1,000,000	1,000,000	1,000,000

Determine the the Net Present Value of all the 3 projects. Assume the interest rate as 15%. Make your comments on the values obtained.

(Marks 07)

(b) You plan to retire at the age of 60 years after a highly successful career. You would like to accumulate enough money by age 60 to withdraw Rs.225,000 per year for 15 years from there on. You plan to pay into your account 30 equal installments beginning when you are 30 and ending when you are 60. Your account bears interest of 12 percent per year.
(i) How much do you need to accumulate in your account by the time you retire?
(ii) How much do you need to pay into your account in each of the 30 equal installments?

(Marks 10)

(c) Discuss the advantages of 'Net Present Value' over 'Internal Rate of Return in capital budgeting.

(Marks 08)

Q4

(a) The inflation rate is 15% and a project is expected to generate 18% per annum return on nominal basis. Calculate the real return.

(Marks 06)

(b) Describe accounting-rate of return (ARR) approach. Compare ARR and the NPV approaches with reference to the time value of money.

(Marks 07)

(c) The management of Sharp Pin Company is contemplating the purchase of a new machine (at a cost of $100,000) capable of producing 192,000 units per year. The old machine that is capable of producing 130,000 units per annum is to be sold for $20,000 in the event of purchasing a new machine. The contribution margin per unit from operating the new machine is $0.125, while it is $0.10 per unit from operating the old machine.
The useful life of the old machine was 10 years when it was purchased 2 years ago. The useful

life of the new machine is eight years. The new machine has a salvage value of $20,000, while the old machine's salvage value is zero. The old machine will require an overhaul at the end of two years from today at a cost of $10,000. The new machine will require an overhaul at the end of the fourth year at a cost of $8,000. The firm's cut off rate for investment decisions is 10 percent. Income taxes are to be ignored. Using the comparative income approach and net present value analysis, determine whether the old machine should be replaced.

(Marks 12)

Q5

(a) An extract of a company balance sheet is as follows;

	Rs. (Million)
Long term loans	1,000
Share capital	800

Average before tax cost of borrowing is 18% and cost of equity (share capital) is 25%. Calculate the Weighted Average Cost of capital of the company.

(Marks 06)

(b) Compare the advantages of 'Discounting cash flow methods' over 'Non discounting cash flow methods' in capital budgeting.

(Marks 09)

(c) A pantry cupboard manufacturer who is determined to expand his business is considering the purchase of several electrically operated machines and tools to reduce both costs of production and time taken for production. The total purchase will cost Rs. 1,695,000 and will have a life of 10 years. These will have only a negligible scrap value, which can be ignored. The machines and tools will result in Labour savings of Rs. 300,000 per year. You may ignore the gains result in from increased volume of production

Compute the internal rate of return (IRR) of this investment

(Marks 10)

Q6

ABC Company operates a snack food center at the Airport. On January 1, 2000 ABC purchased a special cookie-cutting machine, which has been used for three years. ABC is considering purchasing a newer, more efficient machine. If purchased, the new machine would be acquired today, January, 1, 2003. ABC expects to sell 300,000 cookies in each of the next four years. The selling price of each cookie is expected to be Rs.50 on average.

ABC has two options (1) continue to operate the old machine or 2) sell the old machine and purchase the new machine. The seller of the new machine offered no trade in. The following information has been assembled to help management decide which option is more desirable (all values are given in Rs.):

	Old Machine	New Machine
Initial purchase costs of machine	8,000,000	12,000,000
Terminal disposal value at the end of useful life assumed for depreciation purposes	1,000,000	2,000,000
Useful life from date of acquisition	7 years	4 years
Expected annual cash operating costs:		
Variable cost per cookie	20	14
Total fixed costs	1,500,000	1,400,000
Depreciation method used for tax purposes	Straight line	Straight line
Estimated disposal prices of machines:		
January 1, 2003	4,000,000	12,000,000
December 31,2006	700,000	2,000,000

ABC is subject to a 40% income tax rate. Assume that any gain or loss on the sale of machines is treated as an ordinary tax item and will affect the taxes paid by ABC in the year in which it occurs. ABC has an after tax required rate of return of 16%.

(a) Using Net present value method determine whether ABC should retain the old machine or acquire the new machine.

(Marks 10)

(b) How much more or less would the recurring after tax cash operating savings have to be for ABC to exactly earn the 16% after tax required rate of return under both options? Assume all other data about the investment will not change.

(Marks 10)

(c) Assume that the financial differences between the net present values of the two options are so slight that ABC is indifferent between the two proposals. Identify and discuss the non-financial and qualitative factors that ABC should consider.

(Marks 05)